Amendments to the Specification:

Please replace paragraph [0008] with the following amended paragraph:

[0008] FIG. 1B is an illustration showing a front view of one side of a conventional magnetron sputtering system used to sputter deposit layers of the magnetic media. FIG. 1B shows a first target-cathodes 151, and a second target-cathode 152, both with erosion zones and redeposition areas~~, and a transport 170~~, each located within a vacuum chamber 180 and 181 respectively. FIG. 1B also shows substrates 185, a pallet 187 a beam 191, a voltage bias power supply 160, a first power supplies 161, a second power supply 162, and a controller 165. Vacuum chamber 180 and 181 are conventional chambers, typically made of stainless steel that house target-cathodes 151 and 152 respectively, as well as a transport ~~170~~ (not shown). Pallet 187 is typically made of aluminum and is machined to hold substrates 185 in an upward position and in an array. Beam 191 is typically a stainless steel beam from which pallet 187 hangs and is transported in vacuum chamber 180. The target-cathodes include both the target material to be sputtered, the cathode for applying a voltage to the target material, appropriate electrical connections, and cooling mechanism if needed along.

Please replace paragraph [0033] with the following amended paragraph:

[0033] Vacuum chamber ~~180~~ 480 is a conventional chamber, typically made of stainless steel which houses the first target-cathode 451, second target-cathode 452, third target-cathode 453, fourth target-cathode 454, and transport 470. Unlike the prior art described with reference to FIG. 1B, the target-cathodes do not have to be spaced one pallet length apart. The invention permits the same process to be run on these closely spaced target-cathodes as was run on the system with separated target-cathodes shown in FIG. 1B. Pallet 487 is typically made of aluminum and is machined to hold substrates 485 in an array and in an upward position. The pallet 487 is designed to support the substrates by their edges so that both major surfaces of each substrate are exposed during sputtering. Beam 491 is typically a stainless steel beam used to transport pallet 487 in and through vacuum chamber 480. Pallet 487 hangs from beam 491.

Please replace paragraph [0034] with the following amended paragraph:

[0034] The bias power supply 460 is coupled to the pallet 487 and should have a repetition rate that is high enough so that the pallet 487 does not move a significant amount during the target-cathode off-time. The high bias power supply repetition rate helps with film thickness uniformity across the substrates in the direction of travel. The first target-cathode power supply (V1) 461 is used to provide power to the first target-cathode 451 and can be an RF power supply, a DC power supply, or an AC power supply. Other types of power supplies having appropriate repetition rates can be used for this application as well. Similarly, the second target-cathode power supply (V2) 462, third target-cathode power supply (V3) 463, and fourth target-cathode power supply (V4) 464 are used to supply power to target-cathodes 452, 453, and 454 respectively. Controller 465 can be a programmable logic controller (PLC) containing a timing circuit.

The PLC is used to generate a schedule for synchronizing the bias voltages and target-cathode power. Controller ~~430~~ 465 is also used to set bias voltages, turn target-cathodes on and off, select target-cathode powers and keep track of time.

Please replace paragraph [0035] with the following amended paragraph:

[0035] According to one embodiment of the present invention, there are multiple pairs of target-cathodes, each pair being characterized by an optimal voltage V_1, V_2,..., Vn respectively that is recorded in a schedule. A circuit found in controller ~~430~~ 465 is provided to synchronize voltage levels of the target-cathodes and bias voltages. Preferably, the changes in the target-cathode voltage and the pallet bias voltage are initiated or controlled by a timing circuit.

Please replace paragraph [0038] with the following amended paragraph:

[0038] FIG. 5A-5D are block diagrams showing detailed top views of the apparatus in FIG. 4 at different stages of a four-step bias voltage process. FIG. 5A-5D show chamber walls 510 and an additional four target-cathodes positioned on the opposite side of the direction of travel of the pallet. Fifth target-cathode 551 is positioned opposite first target cathode 451, sixth target-cathode 552 is positioned opposite second target cathode 452, seventh target-cathode 553 is positioned opposite third target cathode 453, and eighth target-cathode 554 is positioned opposite fourth target cathode 454. FIG. 5A shows the process in the first step of the four-step voltage bias process. FIG. 5B shows the process in the second step of the four-step voltage bias process. FIG. 5C shows the process in the third step of the four-step voltage bias process. FIG. 5D shows the process in the fourth step of the four-step voltage bias process.

Please replace paragraph [0039] with the following amended paragraph:

[0039] In FIG. 5A, the bias voltage is set at VP1, the first target-cathodes 451 and fifth target-cathode 551 are both set to a voltage of V1 causing plasma ~~465~~ 565 to ignite while the remaining target-cathodes are off. Pallet 487 is subjected to the bias voltage VP1 and moves from left to right passing in front of the plasma ~~465~~ 565 getting a film deposited on it. The bias voltage can be applied on pallet ~~187~~ 487 through a bias rail or other means as is well known in the art. The pallet moves in the direction of ~~he~~ the arrow shown in FIG. 4 or from left to right by being driven with a conveyer system. Both first target-cathodes 451 and fifth target-cathode 551 are maintained at voltage V1 for a predetermined fixed amount of time in accordance with the schedule discussed with reference to FIG. 2 above. In an alternative embodiment a sensor can be used to locate the position of the pallet and set all the voltages according to where the pallet is located. In this alternative embodiment the schedule would have pallet position as one of its entries.

Please replace paragraph [0040] with the following amended paragraph:

[0040] FIG. 5B is a block diagram showing a top view of the FIG. 4 apparatus in the second step of a four-step voltage bias process. In this step the second target-cathode 452 and fifth target-cathode 552 are both set to a voltage of V2 causing plasma ~~465~~ <u>565</u> to ignite again while the remaining target-cathodes are off according to the schedule defined with reference to FIG. 2 above. After a timer indicates that a predetermined amount of time has elapsed, this step begins by shutting off the first target-cathode power supply 461, changing the pallet bias voltage to VP2, and turning on and setting the second target-cathode power supply 462 to voltage V2. This switching process is done quickly so that the amount of distance the pallet 487 travels during the switching process is small. Usually, the switching time takes between 10 milliseconds and 20 milliseconds and since the pallet travels about 20 feet per second, the distance the pallet has moved during the transition is very small.

Please replace paragraph [0044] with the following amended paragraph:

[0044] FIG. 7 is a plot of bias voltage vs. time showing details of the transition between different bias voltages for a system having a single bias voltage step. Curve 705 represents a voltage on the first target-cathode voltage, curve 715 represents a voltage on the second target-cathode, curve 720 represents a first bias voltage on the pallet, curve 725 represents a first transition bias voltage on the pallet, curve 730 represents a second bias voltage ~~730~~ <u>on the pallet</u>, and curve 735 represents a second transition bias voltage on the pallet. FIG. 7 shows the first target-cathode is on and powered to 450 volts for 115 milli-seconds, and then shut off for 15 milli-seconds and the second target-cathode turned on and powered to 450 volts for another 115 milli-seconds. FIG. 7 also shows the bias voltage set at 200 volts for the first 115 milli-seconds while the first target-cathode is on, the bias voltage transition from 200 volts to 400 volts in 15 milli-seconds, the bias voltage remaining at 400 volts for the first 115 milli-seconds while the second target-cathode is on, and finally the bias voltage transition back to 200 volts in 15 milli-seconds. Additionally, FIG. 7 shows both target-cathodes operating at 46% duty cycle with each target-cathode firing at 2.2 times normal power for 115 milli-seconds.